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Yuu Inatomi

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MCDERMOTT, WILL & EMERY  
600 13th Street, N.W.  
WASHINGTON, DC 20005-3096

EXAMINER

DOVE, TRACY MAE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



### **DETAILED ACTION**

This Office Action is in response to the communication filed on 8/29/08. Claims 1, 2, 4, 6-8 and 10-12 are pending. Claims 1, 2, 4, 6 and 7 are withdrawn as being directed toward a nonelected species. This Action is FINAL, as necessitated by amendment.

#### ***Election/Restrictions***

Claims 1, 2, 4, 6 and 7 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 11/20/07.

Applicant elected formula 8 (page 10 of the specification) as the organic compound species and a carbonaceous material as the substrate species.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 10 improperly broadens claim 8, which requires the substrate to be a carbonaceous material. Examiner suggests cancelling claim 10.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8 and 10-12 are rejected under 35 U.S.C. 102(e)/103(a) as being anticipated by, and alternatively unpatentable over, Nakahara et al., US 6,866,964.

Nakahara teaches a secondary battery (electrochemical device) comprising at least a positive electrode, a negative electrode and an electrolyte, wherein an active material in at least one of the positive electrode and the negative electrode contains a radical compound (2:20-25). Examples of the radical compound include formulas (A1) and (A2) in column 3, lines 5-18. The radical compound may be represented by formula (A5) wherein all of the alkyls R<sub>1</sub> to R<sub>4</sub> are methyl (4:35-67). In formula (A5), X<sub>1</sub> and X<sub>2</sub> may both be an aliphatic group that is saturated or unsaturated, substituted or unsubstituted, and straight, cyclic or branched. The radical compound may be represented by formula (A8) wherein all of the alkyls R<sub>1</sub> to R<sub>4</sub> are methyl and X is an aliphatic group (5:50-6:16). See also formula (A30) at column 30. Conductive auxiliary material may be added for reducing impedance during forming an electrode layer

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comprising a radical compound. Examples of such a material include carbonaceous particles such as graphite, carbon black and acetylene black (25:1-10). The negative electrode collector and the positive electrode collector may be a metal foil or metal plate (25:53-61). The mixture including the radical compound and carbonaceous particles is applied to the current collector. Thus the claims are anticipated.

The claims are alternatively unpatentable. Nakahara does not explicitly teach the elected species of Formula 8 in the present specification. However, Nakahara teaches the radical compound may be represented by formula (A8) wherein X is an aliphatic group. The aliphatic group contained in the elected species is one of multiple aliphatic groups. A 35 U.S.C. 102/103 rejection is considered proper where it is unclear if the reference teaches the claimed elected invention with sufficient specificity. The elected radical compound of formula 8 is at least obvious in view of the teachings by Nakahara because no criticality has been shown for the specific aliphatic group of the claimed elected invention. Since both the claimed invention and the prior art teach similar materials (a radical compound mixed with a carbonaceous material), the covalent bond limitation of the claimed invention is considered inherent in the teachings of Nakahara.

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Claims 8 and 10-12 are rejected under 35 U.S.C. 102(b)/103(a) as being anticipated by, and alternatively unpatentable over, Nakahara et al., WO 02/082570 and/or under U.S.C. 102(e)/103(a) as being anticipated by, and alternatively unpatentable over, Nakahara et al., US 7,226,697.

Note US 7,226,697 will be used to discuss the teaching of both Nakahara references since WO 02/082570 was published in Japanese.

Nakahara teaches a charge storage device such as a battery wherein a positive electrode comprises a nitroxyl compound having a structure of a nitroxyl cation moiety represented by formula (I) in an oxidized state while having a structure of a nitroxyl radical moiety represented by formula (II) in a reduced state. The reaction is represented by formula (A) (abstract). Preferably, the nitroxyl compound is a compound containing a cyclic structure represented by general formula (1a) in an oxidized state. In formula (1a), R1 to R4 may each represent an alkyl having 1 to 4 carbon atoms and X represent a bivalent group forming a five-to seven-membered ring. Formula (1a) may be part of a polymer where X is part of a side chain in the polymer or of a main chain of the polymer. The nitroxyl compound is particularly preferably a polymer having a side chain comprising the structure represented by formula (1a) (2:10-30). A preferred nitroxyl compound is represented by formula (1) in column 3. In addition to active material, a positive electrode may comprise other known constituents; for example, a conductivity enhancing material including carbon materials such as charcoal, graphite, carbon black and acetylene black (7:45-57). The negative electrode current collector and the positive electrode current collector may be made of nickel, aluminum, copper, gold, silver, titanium, aluminum alloy or stainless steel (8:49-63). Thus the claims are anticipated.

The claims are alternatively unpatentable. Nakahara does not explicitly teach the elected species of Formula 8 in the present specification. However, Nakahara teaches

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the nitroxyl compound may be represented by formula (1) wherein formula (1) is part of a polymer. A 35 U.S.C. 102/103 rejection is considered proper where it is unclear if the reference teaches the claimed elected invention with sufficient specificity. The elected radical compound of formula 8 is at least obvious in view of the teachings by Nakahara because no criticality has been shown for the specific polymer group (repeat unit structure) of the claimed elected invention. Since both the claimed invention and the prior art teach similar materials (a radical compound mixed with a carbonaceous material), the covalent bond limitation of the claimed invention is considered inherent in the teachings of Nakahara.

### ***Response to Arguments***

Applicant's arguments filed 8/29/08 have been considered but are not found persuasive. Applicant asserts both Nakahara '697 and '964 fail to disclose an electrode comprising an electrode current collector made of metal and an electrode material mixture including a carbonaceous material attached on the electrode current collector. Examiner disagrees. Both Nakahara references teach a carbonaceous material is mixed with the radical compound and then applied to a metal current collector. See discussion of references above. In the remarks section on page 6, lines 5-7 Applicant states that "carbonaceous materials have a large number of surface functional groups. As a result, a carbonaceous material can be readily bonded with organic compounds via a covalent bond". The Examiner has taken the position that the covalent bond limitation of the claimed invention is inherent in the teachings of both Nakahara references because the references teach an organic radical compound mixed with a carbonaceous

material and applied to a metal current collector. Both the nitroxyl radical of the elected invention and the nitroxyl radical of Nakahara function as the electrode reaction site.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is 571-272-1285. The examiner can normally be reached on Monday-Thursday (9:00-7:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Tracy Dove/

Primary Examiner, Art Unit 1795

December 1, 2008